NETTS Project/Demonstration Summary

Title: ENSys Petro Test System NCBC-52-00

Lead PI/Affiliation: Strategic Diagnostics, Inc.

Co-PI's/Affiliations: EPA NERL
TestraTech

Date/Duration:
Initiated – 12/99
Completed - 9/01

Introduction: This demonstration was conducted as part of the EPA Superfund Innovative Technology Evaluation (SITE) Monitoring and Measurement Technology (MMT) Program at Port Hueneme in June 2000. The purpose of the demonstration is to evaluate innovative field measurement devices for TPH in soil in order to determine whether they are more efficient or cost-effective than conventional off-site laboratory measurement methods. Although the off-site laboratory measurement methods currently being used meet most TPH measurement requirements, new field measurement devices may be faster and easier to operate and less expensive.

Abstract: These innovative technologies are demonstrated under field conditions, and the results are compiled, evaluated, published, and disseminated by the EPA ORD. Field analysis was conducted at the NETTS, Port Hueneme CA. With soil core, samples taken at Port Hueneme, Kelley AFB, and a Petroleum Site in Indiana.
The EnSys Petro Test System manufactured by SDI is based on a combination of immunoassy (Specifically enzyme-linked immunosorbent assay) and colorimetry. The device uses methanol for extraction of petroleum hydrocarbons from soil samples. The sample extract is mixed with an enzyme conjugate solution, which is an enzyme bound to a hydrocarbon. The reaction mixture is then transferred to an antibody-coated test tube. The hydrocarbons in the sample extract and those in the enzyme conjugate competitively bind to specific antibody sites on the test tube. The test tube is rinsed with a dilute detergent solution to remove any hydrocarbons bound to the antibodies. A color developer solution and an oxidant are added to the test tube in order to give yellow color to the enzymes that remain attached to the test tube. The color intensity is inversely proportional to the concentration of hydrocarbons in the extract. The EnSys PetroTest System uses a differential photometer that emits light in the visible range to measure absorbance (the intensity of yellow color). According to SDI, the EnSys Petro Test System can be used to measure a large portion of aromatic hydrocarbons.

Results/Conclusions: New Start

Publications: